

CLAIMS:

1. A method for providing a set of voltage waveforms for updating at least a portion of a bi-stable display in successive frame periods, the method comprising:
5 accessing data defining the set of voltage waveforms for the successive frame periods; and
generating the set of voltage waveforms (600, 620, 640, 660; 700, 720, 740, 760; 800, 820, 840, 860) for driving the at least a portion of the bi-stable display (310) during the successive frame periods according to the accessed data; wherein:
10 over a duration of the successive frame periods, each of the voltage waveforms spans a first range of values; and
at least one of the successive frame periods is time-aligned with a data-dependent portion of each of the voltage waveforms that spans a second range of values that is a subset of the first range of values.

15 2. The method of claim 1, wherein:
at least one other of the successive frame periods is time-aligned with a data-dependent portion of each of the voltage waveforms that spans a third range of values that is a subset of the first range of values.

20 3. The method of claim 2, wherein:
the second and third ranges of values are contiguous and span the first range of values.

25 4. The method of claim 1, wherein:
a relatively shorter frame period (FT') is used during the at least one of the successive frame periods.

30 5. The method of claim 1, wherein:
the data-dependent portion of each of the voltage waveforms comprises a reset portion (R).

6. The method of claim 1, wherein:
the data-dependent portion of each of the voltage waveforms comprises a drive portion (D, D1, D2).

5 7. The method of claim 1, wherein:
the data-dependent portion of each of the voltage waveforms comprises a first drive portion (D1), followed by a delay, followed by a second drive portion (D2).

8. The method of claim 1, wherein:
10 the bi-stable display comprises an electrophoretic display.

9. The method of claim 1, further comprising:
lowering a supply voltage of a voltage source used for the generating of the set of voltage waveforms during the at least one of the successive frame periods, from a supply
15 voltage associated with the first range of values to a supply voltage associated with the second range of values.

10. A program storage device tangibly embodying a program of instructions executable by a machine to perform a method for providing a set of voltage waveforms for updating at least a portion of a bi-stable display in successive frame periods, the method comprising:

accessing data defining the set of voltage waveforms for the successive frame periods; and

25 generating the set of voltage waveforms (600, 620, 640, 660; 700, 720, 740, 760; 800, 820, 840, 860) for driving the at least a portion of the bi-stable display (310) during the successive frame periods according to the accessed data; wherein:

over a duration of the successive frame periods, each of the voltage waveforms spans a first range of values; and

30 at least one of the successive frame periods is time-aligned with a data-dependent portion of each of the voltage waveforms that spans a second range of values that is a subset of the first range of values.

11. The program storage device of claim 10, wherein:
at least one other of the successive frame periods is time-aligned with a data-dependent portion of each of the voltage waveforms that spans a third range of values that is a subset of the first range of values.

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12. The program storage device of claim 10, wherein:
a relatively shorter frame period (FT') is used during the at least one of the successive frame periods.

10 13. The program storage device of claim 10, wherein:
the data-dependent portion of each of the voltage waveforms comprises at least one of a reset portion (R) and a drive portion (D, D1, D2).

14. The program storage device of claim 10, wherein:
15 the bi-stable display comprises an electrophoretic display.

15. The program storage device of claim 10, wherein the method further comprises:

lowering a supply voltage of a voltage source used for the generating of the set of
20 voltage waveforms during the at least one of the successive frame periods, from a supply voltage associated with the first range of values to a supply voltage associated with the second range of values.

16. An display device, comprising:
25 a bi-stable display (310); and
a control (100) for providing a set of voltage waveforms for updating at least a portion of a bi-stable display (310) in successive frame periods by: (a) accessing data defining the set of voltage waveforms for the successive frame periods, and (b) generating the set of voltage waveforms (600, 620, 640, 660; 700, 720, 740, 760; 800, 820, 840, 860)
30 for driving the at least a portion of the bi-stable display during the successive frame periods according to the accessed data; wherein:

over a duration of the successive frame periods, each of the voltage waveforms spans a first range of values; and

at least one of the successive frame periods is time-aligned with a data-dependent portion of each of the voltage waveforms that spans a second range of values that is a subset of the first range of values.

17. The display device of claim 16, wherein:

a relatively shorter frame period (FT') is used during the at least one of the successive frame periods.

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18. The display device of claim 16, wherein:

the data-dependent portion of each of the voltage waveforms comprises at least one of a reset portion (R) and a drive portion (D, D1, D2).

15 19. The display device of claim 16, wherein:

the bi-stable display comprises an electrophoretic display.

20. The display device of claim 16, wherein:

the control lowers a supply voltage of a voltage source used for the generating of the set of voltage waveforms during the at least one of the successive frame periods, from a supply voltage associated with the first range of values to a supply voltage associated with the second range of values.

21. A controller (100) comprising means for accessing data defining a set of voltage waveforms (600, 620, 640, 660; 700, 720, 740, 760; 800, 820, 840, 860) for updating at least a portion of a bi-stable display (310) in successive frame periods and comprising an arithmetic logic circuit configured to generate the set of voltage waveforms (600, 620, 640, 660; 700, 720, 740, 760; 800, 820, 840, 860) for driving the at least a portion of the bi-stable display during the successive frame periods according to the accessed data; wherein:

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over a duration of the successive frame periods, each of the voltage waveforms spans a first range of values; and

at least one of the successive frame periods is time-aligned with a data-dependent portion of each of the voltage waveforms that spans a second range of values that is a subset of the first range of values.